

CLAIMS

1. Device for processing an image signal that produces a second image signal to display the image with expansion rate of the image being changed consecutively, based on a first image signal constituted of plural items of pixel data, the device comprising:

phase information generation means for generating phase information of a target position in the second image signal that corresponds to each of the expansion rates;

pixel data production means for producing pixel data of the target position in the second image signal, in accordance with the phase information generated by the phase information generation means; and

image quality adjustment means for adjusting a quality of the image due to the second image signal by using image quality adjustment information generated on the basis of information related to at least the expansion rate of the image.

2. The device for processing an image signal according to claim 1, wherein the quality of the image is a resolution.

3. The device for processing an image signal according to claim 1, wherein the quality of the image is a noise suppression degree.

4. The device for processing an image signal according to claim 1, wherein the information related to the expansion rate of the image is a change rate of the expansion rate.

5. The device for processing an image signal according to claim 1, wherein the information related to the expansion rate of the image is the expansion rate of the image.

6. The device for processing an image signal according to claim 1, wherein the image quality adjustment means further adjusts a quality of an image due to pixel data of the target position in the second image signal by using the image quality adjustment information generated on the basis of characteristics information extracted from plural items of pixel data of the first image signal located in a periphery of the target position in the second image signal.

7. The device for processing an image signal according to claim 1, wherein the characteristics information is a dynamic range which is a difference between a maximum value and a minimum value among the plural items of pixel data of the first image signal.

8. The device for processing an image signal according to claim 1, wherein the characteristics information is movement information obtained by using a difference between items of the pixel data separated in a time direction from each other among the plural items of the pixel data of the first image signal.

9. The device for processing an image signal according to claim 1, wherein the characteristics information is space waveform information which indicates a level distribution of the plural items of the pixel data of the first image signal.

10. The device for processing an image signal according to claim 1, wherein the pixel data generation means comprises:

coefficient data generation means for generating coefficient data corresponding to phase information generated by the phase

information generation means, said coefficient data being used in an estimate equation;

first data selection means for selecting the plural items of pixel data located in a periphery of the target position of the second image signal, based on the first image signal; and

calculation means for obtaining, by calculation, pixel data of the target position in the second image signal based on the estimate equation by using the coefficient data generated by the coefficient data generation means and the plural items of pixel data selected by the first data selection means.

11. The device for processing an image signal according to claim 10, further comprising:

second data selection means for selecting plural items of pixel data located in a periphery of the target position of the second image signal, based on said first image signal; and

class detection means for detecting a class to which the pixel data of the target position in the second image signal belongs, based on the plural items of pixel data selected by the second data selection means,

wherein the coefficient data generation means further generates coefficient data corresponding to the class detected by the class detection means, said coefficient data being used in the estimate equation.

12. The device for processing an image signal according to claim 10, wherein the coefficient data generation means comprises:

storage means for storing coefficient seed data, which is coefficient data in a production equation containing the phase

information as a parameter, said production equation being used to produce the coefficient data used in the estimate equation; and

coefficient data production means for producing the coefficient data used in the estimate equation based on the production equation, by using the coefficient seed data stored in the storage means and the phase information generated by the phase information generation means.

13. The device for processing an image signal according to claim 12, wherein the production equation contains the image quality adjustment information as a parameter; and

wherein the coefficient data production means further produces coefficient data used in the estimate equation based on the production equation, by using the image quality adjustment information.

15

14. The device for processing an image signal according to claim 10, wherein the coefficient data generation means comprises:

storage means for storing coefficient data used in the estimate equation for each of the pieces of phase information that may be generated by the phase information generation means; and

coefficient-data-reading means for reading coefficient data that corresponds to the phase information generated by the phase information generation means, from the storage means.

15. The device for processing an image signal according to claim 14,

wherein the storage means further stores coefficient data used in the estimate equation for each combination of the phase information that may be generated by the phase information generation means and the

image quality adjustment information that may be generated by the image quality adjustment means; and

wherein the coefficient-data-reading means reads coefficient data corresponding to the phase information generated by the phase information generation means and the image quality adjustment information generated by the image quality adjustment means, from the storage means.

16. A method for processing an image signal that produces a second image signal to display the image with expansion rate of the image being changed consecutively, based on a first image signal constituted of plural items of pixel data, the method comprising the steps of:

generating phase information of a target position in the second image signal, said phase information corresponding to each of the expansion rates;

producing pixel data of the target position in the second image signal, in accordance with the phase information generated by the phase information generation means; and

adjusting a quality of the image due to the second image signal by using image quality adjustment information generated on the basis of information related to at least the expansion rate of the image.

17. A computer-readable medium for recording a program that causes a computer to perform a method for processing an image signal that produces a second image signal to display the image with expansion rate of the image being changed consecutively, based on a first image signal constituted of plural items of pixel data, the method comprising the steps of:

generating phase information of a target position in the second image signal, said phase information corresponding to each of the expansion rates;

5 producing pixel data of the target position in the second image signal, in accordance with the phase information generated by the phase information generation means; and

adjusting a quality of the image due to the second image signal by using image quality adjustment information generated on the basis of information related to at least the expansion rate of the image.

10

18. A program for causing a computer to perform a method for processing an image signal that produces a second image signal to display the image with expansion rate of the image being changed consecutively, based on a first image signal constituted of plural items
15 of pixel data, the method comprising the steps of:

generating phase information of a target position in the second image signal, said phase information corresponding to each of the expansion rates;

20 producing pixel data of the target position in the second image signal, in accordance with the phase information generated by the phase information generation means; and

adjusting a quality of the image due to the second image signal by using image quality adjustment information generated on the basis of information related to at least the expansion rate of the image.